International Journal Of

Recent Scientific Research

ISSN: 0976-3031

Volume: 6(12) December -2015

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THE OFFICIAL PUBLICATION OF
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH (IJRSR)
http://www.recentscientific.com/ recentscientific@gmail.com

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

International Journal of Recent Scientific Research
Vol. 6, Issue, 12, pp. 7941-7943, December, 2015

International Journal of Recent Scientific Research

RESEARCH ARTICLE

AN OBSERVATIONAL STUDY ON THE OCCURRENCE OF SNHL IN PATIENTS SUFFERING FROM MIGRAINE

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ARTICLE INFO

Article History:

Received 15th September, 2015
Received in revised form 21st October, 2015
Accepted 06th November, 2015
Published online 28st December, 2015

Key words:

Migraine, sensorineural hearing loss, pure tone audiometry

ABSTRACT

Migraine is one the most commonly seen health complaints in the outpatient department of otorhinolaryngology among all age groups with majority of them presenting without aura(90%) While idiopathic SNHL is also a common complaint in patients of middle age of either gender, deriving a correlation between the two may help understand the pathophysiology of migraine and its effect on SNHL if any may help reduce the incidence of SNHL by treating migraine.

AIM: To study the relation between patients suffering from migraine and sensorineural hearing loss To study the effect of flunarizine on sensorineural hearing loss

RESULTS: A total of 50 patients diagnosed with migraine were subjected to pure tone audiometry at the time of presentation and after treatment for one month with flunarizine. Results of pure tone audiometry showed 8(16%) out of 50 patients to have sensori neural hearing loss suffering from migraine. At the end of one month 3 (6%) out of 50 patients showed to have SNHL, indicating an improvement in 5(out of 8) patients. According to McNemar's test there was a statistically significant association ($p<0.05$) between patients suffering from migraine and SNHL. When pretreatment and post treatment results were compared, the difference recorded was statistically significant($p<0.05$)

INTRODUCTION

Migraine is a chronic neurological disease characterized by recurrent moderate to severe headaches often in association with a number of autonomic nervous system symptoms.

Headache Is typically hemicranial, pulsating in nature, and lasts from 2- 72 hours. It presents with associated symptoms such as nausea, vomiting, photophobia, phonophobia, sensitivity to smell, vertigo, tinnitus

"Migraine without aura" is the most common form of migraine where 90% of the people fall in this category. Aura may present as-vertigo, dizziness, hearing loss, tinnitus and aural ache in addition to phonophobia.

Sensorineural hearing loss (**SNHL**) is a type of hearing loss in which the root cause lies in the vestibulocochlear(CN VIII), the inner ear, or central processing centers of the brain.

Most sensory hearing loss is due to poor hair cell function. The causes can be congenital or acquired Vestibulocochlear disorders accompany the headache in patients with migraine or may occur as aura in periods like noise trauma and infection, and intrinsic abnormalities, like deafness genes. It is known that neurovascular events contribute in pathophysiology of migraine. It is hypothesised that migraine may cause fluctuating low-frequency hearing loss and sudden deafness. The cochlear ischemia can cause hearing loss. Based on the hypothesis that the neurovascular events which contribute to pathophysiology of migraine might affect the ear blood flow by causing changes in veins in inner ear that are fed with terminal veins, and as a result they might induce SNHL

Aim

- To study the relation between patients suffering from migraine and sensorineural hearing loss
- To study the effect of flunarizine on sensorineural hearing loss

Objectives

- To study the association between patients suffering from migraine and SNHL using pure tone audiometry in patients with migraine

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- To study if there is any improvement in sensorineural hearing component in patients treated for migraine with flunarizine

MATERIALS AND METHODS

- STUDY DESIGN- It is a prospective study
- SOURCE OF DATA-

Patients in the age group of 18 to 60 attending
OPD, FMMCH, department of ENT, who were diagnosed to have migraine by clinical and diagnostic criteria for migraine were selected.

METHOD OF SAMPLE COLLECTION

Inclusion criteria- All patients diagnosed clinically with migraine between age group of 18 -60.

Exclusion criteria

- Patients having sinusitis headache
- Patients having headache due to occular symptoms
- Other infective causes of headache
- Patients having ear disease
- Patients who have undergone previous ear surgeries
- Patients on ototoxic drugs within last month

Patients underwent treatment with flunarizine 10 mg OD for one month. Patients underwent repeat PTA after one month.
Results of PTA before and after treatment with flunarizine were compared using McNemar test.

- SAMPLE SIZE-50 patients of either gender in the above mentioned age group
- DURATION OF STUDY- 1 month

RESULTS

1. Age wise classification of number of patients with migraine-showed a maximum incidence of 46% in the age group of 31-40 years

Age in years	Number of patients	Percentage
<20	2	4%
21-30	22	44%
31-40	23	46%
41-50	2	4%
51-60	1	2%

2. Gender wise classification of patients with migraine- 40 (80%) of 50 cases included in the study were females.10 (20%) of 50 cases in the study were males. The study showed a female preponderance

Gender	Number of patients with migraine	Percentage
Males	10	20%
Females	40	80%

3. Sensorineural hearing loss in migraine patients

Snhl	Before treatment	After treatment
Present	8	3

- Mean age of patients with migraine 31.50(+_7.67)
- Gender wise classification showed a female preponderance among migraine patients
- Results of pure tone audiometry showed 8(16%) out of 50 patients to have sensorineural hearing loss suffering from migraine.
- According to McNemar's test there was a statistically significant association ($p<0.05$) between patients suffering from migraine and SNHL
- At the end of one month 3 (6%) out of 50 patients showed to have SNHL,indicating an improvement in 5(out of 8) patients.
- When pretreatment and post treatment results were compared, the difference recorded was statistically significant($p<0.05$)
- DISCUSSION
- In our study the total number of participants was 50 of which 80% were females,which is in agreement with the findings of previous study by Emine Elif Altuntaş and *et al* where there was a female preponderance of 77.8%
- This may be related to more stressful life and higher psychological problems among females.
- In a study as stated by Randolph W. Evans and Gail Ishiyama 2009 49 patients with basilar migraine, one of the more common symptoms reported was impaired hearing, but auditory symptoms (other than phonophobia) were less common than vestibular symptoms
- Bickerstaff had proposed that these neurological symptoms are secondary to vasospasm in the posterior circulation causing ischemia.
- According to Lee H and Whitman GT(2003) Migrainous infarction should be considered in the differential diagnosis of acute hearing symptoms, including unilateral and bilateral hearing loss
- An epidemiological survey of hospitals and private clinics in Japan regarding idiopathic sudden sensorineural hearing loss also revealed similar results
- In studies conducted till now, maximum of 3 months was taken as period of evaluation and follow up
- In our study the duration was for 1 month
- We have used flunarizine 10 mg once at night for one month with the use of diclofenac for acute exacerbation.
- Our study revealed that there was a definite association between migraine patients and SNHL.
- Also an improvement in SNHL(62.5%) by treating migraine reinforces the association of migraine and SNHL

CONCLUSION

- This study concludes that migraine is more common in women
- It is more common in the age group of 31 to 40 years
- The output of many studies and even our study point out that there is a correlation between migraine disease and SNHL.

- Hence, investigating both SNHL patients for migraine and migraine patients for complaints of hearing loss will be fruitful.
- We found out that hearing loss seen in migraine patients may indicate pathophysiological changes which may not be irreversible or repeating attacks might cause pathological changes inducing hearing loss which may be permanent.
- Nevertheless, our evaluations included short time follow up
- Histopathological changes occuring in cochlea were not taken into consideration.
- Therefore, there is a need for prospective studies in future with-

  - a greater sample size,
  - longer duration of medical treatment,
  - regular follow ups for progression of hearing loss or not
  - histopathological evaluation to indicate pathophysiological mechanisms

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How to cite this article:
Laxmi Purushothama and Kuldeep Moras et al., An Observational Study on The Occurrence of Snhl In Patients Suffering From Migraine. *Int J Recent Sci Res* Vol. 6, Issue, 12, pp. 7941-7943.

ISSN 0976-3031